

*1-20, 1-20, 1-20*  
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CLAIMS

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[Claim(s)]

[Claim 1] The manufacture method of the member for electronic parts which carries out patterning of the polyimide film to a mask by carrying out plasma etching processing only from one side using one of the two's metallic foil, and is characterized by removing the metallic foil used for the mask after an appropriate time after forming a resist pattern, respectively on the metallic foil which carried out the laminating to both sides of a polyimide film, carrying out etching processing of both metallic foils in an etching reagent and exfoliating a resist pattern.

[Claim 2] The manufacture method of the member for electronic parts according to claim 1 which used the metallic foil of different species for the metallic foil of both sides of a polyimide film.

[Claim 3] The manufacture method of the member for electronic parts according to claim 2 that the metallic foils of different species are copper foil and stainless steel.

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DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] this invention relates to the manufacture method of the member for electronic parts used for constituting semiconductor package parts, semiconductor mounting parts, electric examination parts, etc.

[0002]

[Description of the Prior Art] Conventionally, there is a layered product of the metallic foil and polyimide film with which processing of a predetermined configuration was given to each as one of this kind of the members for electronic parts. Such a layered product is manufactured in the following procedures so that the manufacturing process of TAB (Tape Automated Bonding) may see. (1) a polyimide film first with adhesives -- metal mold -- using -- holes, such as a sprocket and a device hole, -- perform down processing (2) Next, carry out the laminating of the copper foil to a polyimide film [ finishing / processing ] with a laminator. (3) Subsequently, a polyimide film coats a photoresist to the copper foil by which the laminating was carried out, performs processing of exposure and development using the pattern with which the pattern was formed, and forms a resist pattern on copper foil. (4) The resin which has etching-proof nature in opening of a polyimide film is coated further, and copper foil is \*\*\*\*\*ed by etchant, such as ferric chloride and a copper chloride. (5) Finally, exfoliate a photoresist and obtain the layered product of a polyimide film and copper foil.

[0003]

[Problem(s) to be Solved by the Invention] according to the above-mentioned manufacture method of the \*\*\*\* former -- a polyimide film -- metal mold -- a hole -- since down is performed, when forming a micropore and a slit 0.5mm or less, for example, a barricade does not arise, or an edge configuration is not ready, and there is a trouble that it is not processible with sufficient quality Furthermore, the trouble that it is difficult to perform low-cost processing to this top also has time and effort in the maintenance of metal mold. Moreover, since it expands in case a metallic foil is laminated with a polyimide film, or it contracts, internal stress occurs in a layered product and there is also a trouble said that a strain will arise in a final product. Furthermore, alignment of the patterning of a metallic foil must be carried out to the hole processed into the polyimide film, it must be performed, and also has the trouble that alignment precision is needed.

[0004] this invention is made in view of the above troubles, and the place made into the purpose is to offer the manufacture method of the member for electronic parts that a quality thing is obtained by the low cost.

[0005]

[Means for Solving the Problem] In order to solve the above-mentioned trouble, the manufacture method of the member for electronic parts of this invention A resist pattern is formed, respectively on the metallic foil which carried out the laminating to both sides of a polyimide film. After carrying out etching processing of both metallic foils in an etching reagent and exfoliating a resist pattern Patterning of the polyimide film is carried out to a mask by carrying out plasma etching processing only from one side using one of the two's metallic foil, and it is characterized by removing the metallic foil used for the mask after an appropriate time.

[0006]

[Embodiments of the Invention] Drawing 1 is process drawing of the manufacture method of the member for electronic parts concerning this invention, and explains the gestalt of operation of this invention with reference to this drawing hereafter.

[0007] First, as shown in drawing 1 (a), the substrate which carries out the laminating of the metallic foils 2 and 3 to both sides of the polyimide film 1, respectively, and becomes them is prepared. Patterning of the double-sided photoresist layer is carried out by the exposure processing through the photo mask in which a photoresist layer is formed in both sides after performing predetermined pretreatment to this substrate, and the predetermined pattern is formed, and the development following it, and as shown in drawing 1 (b), the resist patterns 4 and 5 are formed on each metallic foils 2 and 3. Then, as shown in drawing 1 (c), the double-sided metallic foils 2 and 3 are \*\*\*\*\*ed in an etching reagent. In this case, the double-sided metallic foils 2 and 3 are not cared about, even if you may \*\*\*\*\* simultaneously and it \*\*\*\*\*s in order. If it \*\*\*\*\*s simultaneously, there is an advantage which can reduce one process. Moreover, it is more advantageous to \*\*\*\*\* in order, when detailed processing is required. Thus, after finishing etching processing, as shown in drawing 1 (d), the resist patterns 4 and 5 are exfoliated. Then, as shown in drawing 1 (e), where a substrate is reversed, it lays on a stage 6, and the polyimide film 1 is processed into a mask by plasma etching 7 using the direction of a metallic foil 3 to copper foil. The member for electronic parts which is the layered product 8 with the metallic foil 2 by which finally carried out dissolution removal of the metallic foil 3 of the

field which etched the polyimide film 1, and patterning was carried out to the polyimide film 1 by which patterning was carried out as shown in drawing 1 (f) is obtained. The member for electronic parts to which the laminating of a metallic foil and the polyimide film was carried out with position precision with those good patterns by this is manufactured.

[0008] In the above layered products 8, a desired configuration should just be used for the polyimide film 1 and the pattern formed in a metallic foil 2 according to uses, such as a hole and a slit.

[0009] Moreover, according to a use, it may gold-plate at the metallic foil 2 of the layered product 8 obtained as mentioned above, and you may make it multilayer structure.

[0010]

[Example] Next, the example of this invention is explained.

[0011] First, the substrate of the three-tiered structure which comes to carry out the laminating of copper foil with a thickness of 18 micrometers and the stainless steel with a thickness of 20 micrometers to both sides of a polyimide film with a thickness of 18 micrometers, respectively was prepared. And after performing degreasing processing to this substrate, the photoresist layer was formed in both sides by applying the liquid resist (product made from JSR "THB37") of a negative mold. Subsequently, after exposing a resist layer by the high pressure mercury vapor lamp through the mask with which the predetermined pattern was formed, negatives were developed with the predetermined developer and the resist pattern of a predetermined configuration was formed in both sides, respectively.

[0012] next, an etching reagent -- ferric chloride -- using it -- double-sided copper foil and double-sided stainless steel -- simultaneous--etching--the resist-pattern-was-exfoliated-the-back-using-predetermined-ablation-liquid-the-bottom-Then, the stainless steel side of a substrate was turned down, the substrate concerned was laid on the stage, and the polyimide film was processed into the mask by plasma etching using copper foil. At the last, dissolution removal of the copper foil was carried out, and the member for electronic parts of the request to which the laminating of the stainless steel by which patterning was carried out to the polyimide film by which patterning was carried out was carried out was obtained.

[0013]

[Effect of the Invention] As explained above, the manufacture method of the member for electronic parts of this invention A resist pattern is formed, respectively on the metallic foil which carried out the laminating to both sides of a polyimide film. Since it is made to carry out etching processing of both metallic foils in an etching reagent and the polyimide film was made to carry out patterning of one of the two's metallic foil by which patterning was carried out by the plasma etching processing used for the mask. From the ability of etching of a metallic foil, and etching of a polyimide film to be performed in one platemaking It can manufacture by the low cost, and since a laminating will moreover be carried out by the pattern of a polyimide film, and the pattern of a metallic foil with a good position precision, a quality thing can be obtained.

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**PRIOR ART**

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[Description of the Prior Art] Conventionally, there is a layered product of the metallic foil and polyimide film with which processing of a predetermined configuration was given to each as one of this kind of the members for electronic parts. Such a layered product is manufactured in the following procedures so that the manufacturing process of TAB (Tape Automated Bonding) may see. (1) a polyimide film first with adhesives -- metal mold -- using -- holes, such as a sprocket and a device hole, -- perform dawn processing (2) Next, carry out the laminating of the copper foil to a polyimide film [ finishing / processing ] with a laminator. (3) Subsequently, a polyimide film coats a photoresist to the copper foil by which the laminating was carried out, performs processing of exposure and development using the pattern with which the pattern was formed, and forms a resist pattern on copper foil. (4) The resin which has etching-proof nature in opening of a polyimide film is coated further, and copper foil is \*\*\*\*\*ed by etchant, such as ferric chloride and a copper chloride. (5) Finally, exfoliate a photoresist and obtain the layered product of a polyimide film and copper foil.

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**EFFECT OF THE INVENTION**

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[Effect of the Invention] As explained above, it is the manufacture method of the member for electronic parts of this invention. A resist pattern is formed, respectively on the metallic foil which carried out the laminating to both sides of a polyimide film. Since it is made to carry out etching processing of both metallic foils in an etching reagent and the polyimide film was made to carry out patterning of one of the two's metallic foil by which patterning was carried out by the plasma etching processing used for the mask. From the ability of etching of a metallic foil, and etching of a polyimide film to be performed in one platemaking It can manufacture by the low cost, and since a laminating will moreover be carried out by the pattern of a polyimide film, and the pattern of a metallic foil with a good position precision, a quality thing can be obtained.

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**MEANS**

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[Means for Solving the Problem] In order to solve the above-mentioned trouble, the manufacture method of the member for electronic parts of this invention A resist pattern is formed, respectively on the metallic foil which carried out the laminating to both sides of a polyimide film. After carrying out etching processing of both metallic foils in an etching reagent and exfoliating a resist pattern Patterning of the polyimide film is carried out to a mask by carrying out plasma etching processing only from one side using one of the two's metallic foil, and it is characterized by removing the metallic foil used for the mask after an appropriate time.

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**DESCRIPTION OF DRAWINGS**

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[Brief Description of the Drawings]

[Drawing 1] It is process drawing of the manufacture method of the member for electronic parts concerning this invention.

[Description of Notations]

1 Polyimide Film

2 Three Metallic foil

4 Five Resist pattern.

6 Stage

7 Plasma Etching

8 Layered Product

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[Translation done.]

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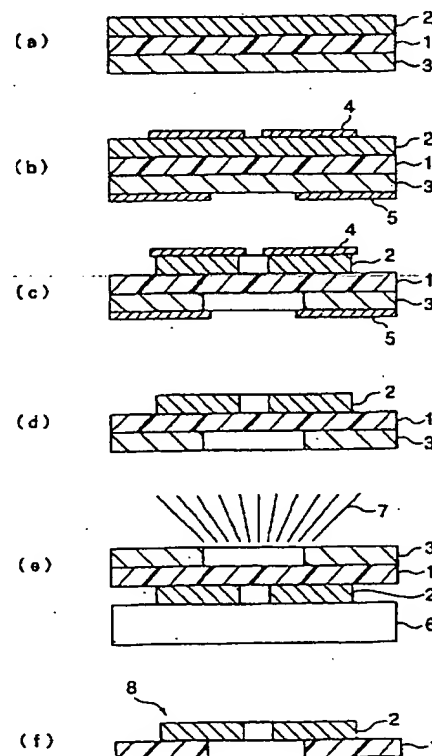
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(54) 【発明の名称】 電子部品用部材の製造方法

(57) 【要約】

【課題】 低コストで高品質のものが得られる電子部品用部材の製造方法を提供する。

【解決手段】 ポリイミドフィルム1の両面に積層した金属箔2、3の上にそれぞれ対してレジストパターン4、5を形成し、両方の金属箔2、3をエッチング液にて同時にエッチング処理した後、レジストパターン4、5を剥離してから、片方の金属箔3をマスクに利用してプラズマエッチングすることでポリイミドフィルム1をパターニングし、しかる後にマスクに使用した金属箔3を除去することで、パターニングされたポリイミドフィルム1とパターニングされた金属箔2との積層体8である電子部品用部材を得る。製版が一回でよいので低コストで製造でき、しかもポリイミドフィルムのパターンと金属箔のパターンとが良好な位置精度を持って積層された高品質のものを得ることができる。





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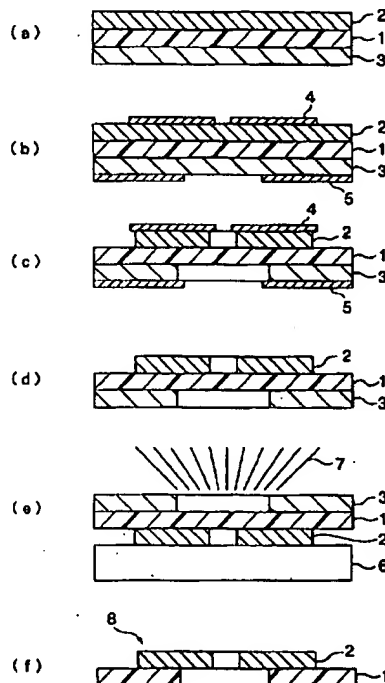
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(54) 【発明の名称】 電子部品用部材の製造方法

(57) 【要約】

【課題】 低コストで高品質のものが得られる電子部品用部材の製造方法を提供する。

【解決手段】 ポリイミドフィルム1の両面に積層した金属箔2、3の上にそれぞれ対してレジストパターン4、5を形成し、両方の金属箔2、3をエッチング液にて同時にエッチング処理した後、レジストパターン4、5を剥離してから、片方の金属箔3をマスクに利用してプラズマエッチングすることでポリイミドフィルム1をパターニングし、しかる後にマスクに使用した金属箔3を除去することで、パターニングされたポリイミドフィルム1とパターニングされた金属箔2との積層体8である電子部品用部材を得る。製版が一回でよいので低コストで製造でき、しかもポリイミドフィルムのパターンと金属箔のパターンとが良好な位置精度を持って積層された高品質のものを得ることができる。



## 【特許請求の範囲】

【請求項1】 ポリイミドフィルムの両面に積層した金属箔の上にそれぞれレジストパターンを形成し、両方の金属箔をエッチング液にてエッチング処理した後、レジストパターンを剥離してから、片方の金属箔をマスクに利用して片面からのみプラズマエッチング処理することでポリイミドフィルムをパターンニングし、しかる後にマスクに使用した金属箔を除去することを特徴とする電子部品用部材の製造方法。

【請求項2】 ポリイミドフィルムの両面の金属箔に異種類の金属箔を使用した請求項1に記載の電子部品用部材の製造方法。

【請求項3】 異種類の金属箔が銅箔とステンレスである請求項2に記載の電子部品用部材の製造方法。

## 【発明の詳細な説明】

## 【0001】

【発明の属する技術分野】本発明は、半導体パッケージ部品、半導体実装部品、電気的試験部品等を構成するのに用いられる電子部品用部材の製造方法に関するものである。

## 【0002】

【従来の技術】従来、この種の電子部品用部材の一つとして、それぞれに所定形状の加工が施された金属箔とポリイミドフィルムの積層体がある。このような積層体は、例えばTAB（Tape Automated Bonding）の製造工程に見られるように次のような手順で製造されている。（1）まず、接着剤付きのポリイミドフィルムに金型を用いてスプロケット及びデバイスホール等の孔明け加工を行う。（2）次に、加工済みのポリイミドフィルムに銅箔をラミネータにより積層する。（3）次いで、ポリイミドフィルムが積層された銅箔に対してフォトレジストをコーティングし、絵柄の形成されたパターンを用いて露光及び現像の処理を行い、銅箔上にレジストパターンを形成する。（4）さらに、ポリイミドフィルムの開口部に耐エッチング性のある樹脂をコーティングし、塩化鉄、塩化銅等のエッチャントで銅箔をエッチングする。（5）最後に、フォトレジストを剥離してポリイミドフィルムと銅箔の積層体を得る。

## 【0003】

【発明が解決しようとする課題】上記した如き従来の製造方法によると、ポリイミドフィルムに金型で孔明けを行うので、例えば0.5mm以下の微細孔やスリットを形成する場合に、バリが生じたりエッジ形状が整わなかったりして、品質よく加工を行うことができないという問題点がある。さらに、金型のメンテナンスに手間がかかる上に、低コスト加工を行うのが難しいという問題点もある。また、金属箔をポリイミドフィルムとラミネートする際に膨張したり収縮するので、積層体に内部応力が発生し、最終製品にひずみが生じてしまうといった問題点もある。さらに、金属箔のパターンニングは、ポリイ

ミドフィルムに加工された孔にアライメントして行わなければならない、位置合わせ精度が必要になるという問題点もある。

【0004】本発明は、上記のような問題点に鑑みてなされたものであり、その目的とするところは、低コストで高品質のものが得られる電子部品用部材の製造方法を提供することにある。

## 【0005】

【課題を解決するための手段】上記の問題点を解決するために、本発明の電子部品用部材の製造方法は、ポリイミドフィルムの両面に積層した金属箔の上にそれぞれレジストパターンを形成し、両方の金属箔をエッチング液にてエッチング処理した後、レジストパターンを剥離してから、片方の金属箔をマスクに利用して片面からのみプラズマエッチング処理することでポリイミドフィルムをパターンニングし、しかる後にマスクに使用した金属箔を除去することを特徴とするものである。

## 【0006】

【発明の実施の形態】図1は本発明に係る電子部品用部材の製造方法の工程図であり、以下、この図面を参照して本発明の実施の形態について説明する。

【0007】まず、図1（a）に示すように、ポリイミドフィルム1の両面にそれぞれ金属箔2、3を積層してなる基板を準備する。この基板に所定の前処理を施してから両面にフォトレジスト層を形成し、所定の絵柄が形成してあるフォトマスクを介しての露光処理とそれに続く現像処理により両面のフォトレジスト層をパターンニングして、図1（b）に示すように各金属箔2、3の上にレジストパターン4、5を形成する。続いて、図1

（c）に示すように、エッチング液にて両面の金属箔2、3をエッチングする。この場合、両面の金属箔2、3を同時にエッチングしてもよいし、順番にエッチングしても構わない。同時にエッチングすれば工程を1つ減らせる利点がある。また、微細な加工が必要な場合には順番にエッチングする方が有利である。このようにエッチング処理を終えた後、図1（d）に示すようにレジストパターン4、5を剥離する。続いて、図1（e）に示すように、基板を反転させた状態でステージ6の上に載置し、プラズマエッチング7により金属箔3の方から、すなわち銅箔をマスクに利用してポリイミドフィルム1を加工する。最後に、ポリイミドフィルム1のエッチングを行った面の金属箔3を溶解除去し、図1（f）に示すような、パターンニングされたポリイミドフィルム1とパターンニングされた金属箔2との積層体8である電子部品用部材を得る。これにより、金属箔とポリイミドフィルムとがそれらのパターンが良好な位置精度を持って積層された電子部品用部材が製造される。

【0008】上記のような積層体8において、ポリイミドフィルム1と金属箔2に形成するパターンは、孔やスリットなど用途に応じて所望の形状を採用すればよい。

【0009】また、用途に応じて、上記のようにして得られた積層体8の金属箔2に金メッキを施して多層構造にしてもよい。

【0010】

【実施例】次に、本発明の実施例について説明する。

【0011】まず、厚さ18 $\mu$ mのポリイミドフィルムの両面にそれぞれ厚さ18 $\mu$ mの銅箔と厚さ20 $\mu$ mのステンレスを積層してなる3層構造の基板を準備した。そして、この基板に対して脱脂処理を行ってから、ネガ型の液体レジスト（JSR製「THB37」）を塗布すること

で両面にフォトリソ層を形成した。次いで、所定のパターンが形成されたマスクを介して高圧水銀灯でレジスト層を露光した後、所定の現像液で現像して両面にそれぞれ所定形状のレジストパターンを形成した。

【0012】次に、エッチング液に塩化鉄を使用して両面の銅箔とステンレスを同時にエッチングした後、所定の剥離液を用いてレジストパターンを剥離した。続いて、基板のステンレス側を下にして当該基板をステージの上に載置し、銅箔をマスクに利用してプラズマエッチングによりポリイミドフィルムを加工した。最後に、銅箔を溶解除去して、パターニングされたポリイミドフィルムとパターニングされたステンレスとが積層された所望の電子部品用部材を得た。

【0013】

【発明の効果】以上説明したように、本発明の電子部品用部材の製造方法は、ポリイミドフィルムの両面に積層した金属箔の上にそれぞれレジストパターンを形成し、両方の金属箔をエッチング液にてエッチング処理するようにし、ポリイミドフィルムはパターニングされた片方の金属箔をマスクに利用したプラズマエッチング処理にてパターニングするようにしたので、一回の製版にて金属箔のエッチングとポリイミドフィルムのエッチングとを行うことができることから、低コストで製造することができ、しかもポリイミドフィルムのパターンと金属箔のパターンとが良好な位置精度を持って積層された状態になるので、高品質のものを得ることができる。

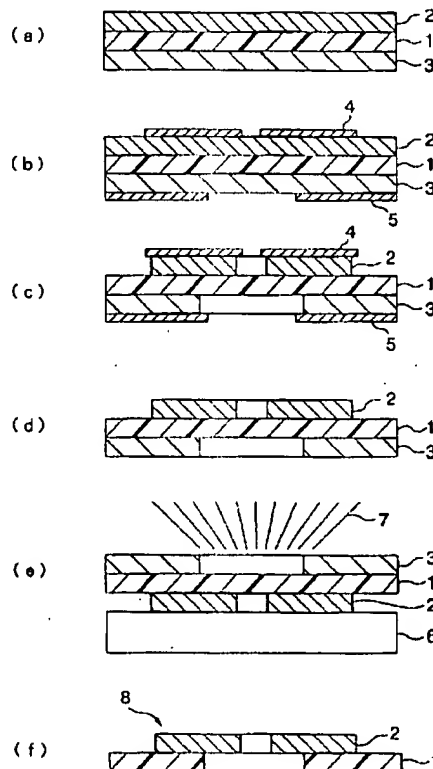
【図面の簡単な説明】

【図1】本発明に係る電子部品用部材の製造方法の工程図である。

【符号の説明】

- 1 ポリイミドフィルム
- 2、3 金属箔
- 4、5 レジストパターン
- 6 ステージ
- 7 プラズマエッチング
- 8 積層体

【図1】



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